floating debris; at noon of the 27th it became stationary, having reached a point two feet and eight-tenths above the danger line; on the 28th it began to fall slowly.

Reports from Montreal, Quebec, on the 23d, stated that the Saint Lawrence river had risen one foot and three inches during the preceding twenty-four hours and that the basements of many buildings on the lower streets were flooded. A large part of the village of La Prairie was inundated. The village of Saint Gabriel, near Quebec, was submerged in many places to depths of from six to eight feet. On the 29th it was reported that the damage caused by the freshet at Montreal was estimated at $100,000.

Fort Edward, New York, 24th: about thirty feet of the dam across the Hudson river at this place has been carried away; the water reached the highest point that has been known here for fifteen years.

Saint John, New Brunswick, 27th: a destructive freshet has occurred in the Saint John river; many bridges have been washed away and extensive washouts have occurred along the railroad from Woodstock to Presque Isle.

HIGH TIDES.

Indianola, Texas, 13th, 21st, 22d, 24th.
New London, Connecticut, 26th.

LOW TIDES.

New River Inlet, North Carolina, 20th, 21st, 23d.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for April, 1885, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 83.26 per cent. The percentages for the four elements are: Weather, 87.42; direction of the wind, 79.07; temperature, 79.83; barometer, 88.46 per cent. By geographical districts, they are: For New England, 81.16; middle Atlantic states, 85.57; south Atlantic states, 83.13; eastern Gulf states, 83.56; western Gulf states, 84.71; lower lake region, 80.96; upper lake region, 80.98; Ohio valley and Tennessee, 85.96; upper Mississippi valley, 85.04; Missouri valley, 82.09; north Pacific coast region, 84.20; middle Pacific coast region, 78.16; south Pacific coast region, 86.60. There were forty-six omissions to predict out of 3,753, or 1.22 per cent. Of the 3,707 predictions that have been made, eighty-five, or 2.29 per cent., are considered to have entirely failed; one hundred and thirty-nine, or 3.75 per cent., were one-fourth verified; five hundred and forty-two, or 14.62 per cent., were one-half verified; six hundred and forty-one, or 17.29 per cent., were three-fourths verified; 2,300, or 62.05 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

CAUTIONARY SIGNALS.

During April, 1885, one hundred and eighty-three cautionary signals were ordered. Of these, one hundred and forty-nine, or 81.42 per cent., were justified by winds of twenty-five miles or more per hour at or within one hundred miles of the station. Thirty-seven off-shore signals were ordered, of which number, twenty-nine, or 78.38 per cent., were fully justified both as to direction and velocity; thirty-four, or 91.89 per cent., were justified as to direction; and thirty-two, or 86.49 per cent., were justified as to velocity. Two hundred and twenty signals of all kinds were ordered, one hundred and seventy-eight, or 80.9 per cent., being fully justified. These do not include signals ordered at display stations where the velocity of the wind is only estimated. Of the above cautionary off-shore signals, twenty-six were changed from cautionary. Five signals were ordered late. In ninety-three cases, winds of twenty-five miles or more per hour were reported for which no signals were ordered.

COLD-WAVE SIGNALS.

During April, 1885, there were seventy-six cold-wave signals ordered, of which number sixty-six, or 86.8 per cent., were justified.

RAILWAY WEATHER SIGNALS.

The following extract is from the April report of the "Alabama Weather Service," under direction of Prof. P. H. Mell, jr.:

Since the last bulletin was issued the Northeastern railroad of Georgia and the division of the East Tennessee, Virginia and Georgia railroad system, extending from Rome, Georgia, to Selma, Alabama, have been added to the service; on the latter road the signals are exposed on the trains and not at the stations, as at other points in the state. Besides the roads mentioned, stations along the Western, the South and North, the Mobile and Girard, the Montgomery and Mobile, Atlanta and West Point, and the Georgia Pacific railroads have furnished reports which show the verification of predictions to be, for the whole state, 92 per cent. for temperature and 91 per cent. for weather.

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; and the mean temperature of the air at the station. Observations were interrupted by ice during the month as follows: Grand Haven, Michigan, from 1st to 4th; Toledo, Ohio, from 1st to 5th; Detroit, Michigan and Sandusky, Ohio, from 1st to 6th; Cleveland, Ohio, from 1st to 11th; Buffalo, New York and Milwaukee, Wisconsin, from 1st to 18th; Alpena, Michigan, from 1st to 20th; Detroit, Michigan, on 21st and 22d; Duluth, Minnesota, from 1st to 28th; Escanaba and Mackinaw City, Michigan, throughout the month.

Temperature of water for April, 1885.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°		°
Atlantic City, New Jersey	56.0	43.1	12.9	4 3	46.6
Alpena, Michigan*	40.0	31.5	8.5	12 2	34.7
Augusta, Georgia	72.0	58.0	14.0	7 6	63.0
Baltimore, Maryland	59.2	39.4	19.8	10 2	54.2
Block Island, Rhode Island	45.6	38.0	7.6	7 3	44.6
Boston, Massachusetts	51.3	33.7	17.6	21 3	46.3
Buffalo, New York*	44.1	33.5	10.6	8 0	39.9
Canby, Fort, Washington Territory	54.3	49.1	5.2	14 9	48.9
Cedar Keys, Florida	78.8	67.1	11.7	8 4	69.4
Chicago, Illinois	52.9	30.7	16.2	7 4	45.3
Charleston, South Carolina	68.8	54.0	14.8	41 0	63.8
Chincoteague, Virginia	64.2	37.0	25.3	2 9	50.8
Cleveland, Ohio*	46.8	35.6	11.2	14 0	44.0
Detroit, Michigan*	46.2	34.0	12.2	24 4	45.1
Duluth, Minnesota*	35.9	35.6	0.3	9 8	36.8
Eastport, Maine	37.4	33.5	3.9	15 1	39.8
Escanaba, Michigan*	77.4	64.5	12.9	12 9	71.9
Galveston, Texas	59.6	32.7	26.9	19 0	42.7
Grand Haven, Michigan*	77.5	67.5	10.0	9 0	71.5
Indianola, Texas	76.8	65.5	11.3	18 0	67.7
Jacksonville, Florida	83.7	74.6	9.1	17 0	76.0
Key West, Florida					
Mackinaw City, Michigan*	69.1	49.6	19.5	5 8	58.9
Macon, Fort, North Carolina					
Marquette, Michigan	45.1	39.1	6.0	8 0	40.4
Milwaukee, Wisconsin*	73.5	58.8	14.7	18 1	66.2
Mobile, Alabama	54.5	38.1	16.4	16 4	46.0
New Haven, Connecticut	45.7	35.1	10.6	11 7	47.0
New London, Connecticut	48.8	36.8	12.0	13 7	47.7
New York City	64.3	47.8	16.5	10 5	57.1
Norfolk, Virginia	71.9	60.3	11.6	17 6	67.0
Pensacola, Florida	45.4	33.3	12.1	16 7	46.1
Portland, Maine	57.4	51.1	6.3	57 5	53.1
Portland, Oregon	54.0	35.0	19.0	10 0	44.9
Sandusky, Ohio*	50.5	40.2	10.3	1 6	47.2
Sandy Hook, New Jersey	59.9	56.9	3.0	35 8	57.1
San Francisco, California	73.0	58.8	14.2	9 3	65.9
Savannah, Georgia	67.2	50.6	16.6	10 9	59.2
Smithville, North Carolina	59.2	39.2	20.0	12 9	46 0
Toledo, Ohio*	68.0	51.0	17.0	14 8	61.8
Wilmington, North Carolina					

* Observations interrupted by ice—see text.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroral displays were not numerous during April, 1885. The principal and most extensively observed display was that of the 7–8th; it was reported from stations in the north Pacific coast region, the extreme northwest, Mississippi and Missouri valleys, and in northern Maine. This display was not noticed in the lake districts, owing probably to the cloudiness which prevailed in that region.

Table of miscellaneous meteorological data for April, 1885—Signal Service observations.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths): Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes: Highest barometer	Date.	Lowest barometer	Date.	Monthly range of barometer.	Temperature of the air (in degrees Fahrenheit): Monthly mean.	Departure from normal.	Extremes: Max.	Date.	Mean max	Min.	Date.	Mean min	Monthly range.	Daily ranges: Greatest.	Date.	Least.	Date.	Mean rel. humidity.	Mean dew-point.	Precipitation.	Departure from normal	Winds: Total movement.	Prevailing direction.	Max. velocity: Miles p. hr	Direction.	Date.	No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
New England.																																			
Eastport	61	29.86	+.08	29.93	30.46	19	29.39	5	1.07	39.8	+1.8	66.2	20	46.0	23.2	10	33.9	43.0	27.2	20	3.0	13	67.8	29.2	5.35	+1.68	6,760	s.	48	e.	4	14	7	14	9
Portland	45	29.91	+.05	29.90	30.52	19	29.43	4	1.09	46.1	+2.8	71.9	24	55.3	28.4	9	38.4	43.5	29.5	20	3.7	4	65.4	34.1	2.09	−0.93	6,296	nw.	36	ne.	29	9	6	10	14
Mount Washington	6,279	23.60	....	30.00	30.56	19	29.49	6	1.07	23.0	+2.1	56.5	24	31.0	−10.3	9	15.6	66.8	30.4	2	5.0	17	90.0	20.4	2.66	−1.62	25,070	nw.	96	nw.	27	17	5	15	10
Thatcher's Island	48	....	....	....	....	...	....	...	......	......	....	......	...	......	......	...	......	......	......	...	......	...	......	......	....	....	....	....	...	....	...	...	...	...	...
Boston	122	29.84	+.06	29.97	30.55	19	29.20	29	1.35	46.3	+2.4	72.4	24	56.4	27.2	10	38.4	55.2	33.4	3	3.3	4	64.2	33.6	3.30	−0.76	9,323	w.	50	n.	29	10	7	7	15
Point Judith	....	....	....	....	....	...	....	...	......	43.1	....	65.0	22	50.3	27.0	11	30.0	38.0	......	...	......	...	......	......	2.25	....	....	....	...	....	...	6	...	...	...
Block Island	27	29.97	....	29.99	30.54	19	29.23	29	1.31	44.6	+1.8	69.9	22	53.1	27.4	9	38.5	42.5	23.5	22	5.9	20	76.9	37.0	2.65	−0.93	8,762	sw.	44	n.	29	7	5	12	13
Narragansett Pier	....	....	....	....	....	...	....	...	......	45.5	....	71.0	22	55.3	27.0	9	35.7	44.0	......	...	......	...	......	......	2.67	....	....	....	...	....	...	9	...	...	...
New London	47	29.98	+.12	30.02	30.56	19	29.29	29	1.27	47.0	+2.1	77.9	22	55.7	26.3	10	38.1	51.6	29.3	21	6.2	26	66.2	35.2	3.34	−0.57	5,711	n.	29	nw.	6	9	5	9	16
New Haven	107	29.90	....	30.01	30.56	19	29.34	29	1.22	46.0	+0.4	83.0	22	56.1	23.3	9	36.5	59.7	31.6	19	9.0	26	65.6	33.6	2.31	−1.85	5,856	s.	35	nw.	29	9	4	11	15
Middle Atlantic states.																																			
Albany	75	29.95	+.10	30.03	30.59	19	29.52	28	1.07	45.3	+0.1	84.6	22	57.3	23.5	9	35.2	61.1	35.0	20	8.7	6	62.5	31.9	2.89	+0.09	5,125	nw.	32	sw.	2	10	7	12	11
New York City	164	29.86	+.08	30.03	30.61	20	29.40	29	1.15	47.7	+0.4	81.5	22	58.3	26.9	9	39.7	54.6	30.3	21	8.7	15	67.8	36.7	2.44	−0.77	6,838	nw.	45	w.	6	9	7	8	15
Sandy Hook	28	30.01	+.08	30.03	30.60	19	29.49	29	1.11	47.2	+1.0	80.5	22	56.8	28.0	9	39.5	52.5	31.9	21	6.2	20	68.7	36.5	2.47	−2.68	11,987	w.	64	nw.	29	12	7	10	13
Barnegat City	22	30.01	+.07	30.02	30.60	19	29.45	4	1.15	47.5	+1.9	72.0	27	55.6	28.4	9	39.4	43.6	27.2	21	5.2	18	76.6	40.0	0.89	−2.92	10,491	nw.	46	nw.	29	10	4	10	10
Little Egg Harbor	....	....	....	....	....	...	....	...	......	47.2	....	70.8	27	55.2	27.8	9	39.2	43.0	......	...	......	...	......	......	1.07	....	....	....	...	....	...	9	...	...	...
Atlantic City	13	30.01	+.06	30.01	30.59	19	29.46	4	1.13	46.6	+0.3	75.2	27	54.6	28.9	9	39.2	46.3	29.7	27	4.0	2	83.5	41.6	1.68	−1.98	5,281	nw.	30	nw.	29	6	4	13	13
Cape May	27	30.01	....	30.02	30.55	20	29.45	4	1.10	48.9	+0.8	82.5	27	55.8	31.0	9	41.8	51.5	32.6	17	6.8	12	79.3	42.5	1.87	−3.31	10,909	s.	70	nw.	29	8	4	16	10
Philadelphia	117	29.92	+.07	30.04	30.60	20	29.50	4	1.10	49.8	+0.3	86.8	22	60.9	26.6	9	40.4	60.2	30.9	21	9.3	11	67.8	38.6	2.54	−0.50	7,518	w.	47	nw.	29	8	4	16	10
Baltimore	45	30.01	+.06	30.04	30.59	20	29.55	28	1.04	54.2	+1.6	81.5	23	64.0	31.5	14	45.3	50.0	27.1	21	9.8	10	50.2	37.5	1.37	−1.82	4,333	nw.	31	nw.	29	9	8	11	11
Washington City	106	29.96	+.08	30.06	30.61	20	29.55	4	1.06	53.1	+0.5	86.3	22	64.5	30.2	14	42.8	56.1	34.9	22	9.1	10	59.4	37.7	1.71	−1.28	4,947	nw.	32	nw.	29	9	5	14	11
Delaware Breakwater	20	....	....	....	....	...	....	...	......	......	....	......	...	......	......	...	......	......	......	...	......	...	......	......	....	....	....	....	...	....	...	...	...	...	...
Ocean City	....	....	....	....	....	...	....	...	......	48.1	....	70.0	22	55.3	32.2	5	40.8	37.8	......	...	......	...	......	......	1.55	....	....	....	...	....	..	9	...	...	...
Chincoteague	8	30.05	+.07	30.04	30.58	20	29.50	4	1.08	50.8	+1.4	81.0	22	58.7	31.0	11	41.5	50.0	32.2	22	8.7	16	74.8	42.4	0.97	−1.42	7,694	s.	50	nw.	29	9	7	9	14
Cape Henry	16	30.05	+.08	30.05	30.58	20	29.58	4	1.00	54.0	+0.1	75.9	20	62.6	34.7	11	46.8	41.2	23.9	15	6.3	17	70.8	44.1	1.45	−4.04	9,649	s.	56	nw.	29	7	3	14	13
Norfolk	30	30.02	+.06	30.03	30.54	20	29.61	28	0.93	57.1	+1.5	81.4	24	66.2	34.9	11	47.9	46.5	30.0	21	4.3	17	69.2	46.3	1.92	−2.20	5,864	ne.	26	nw.	13	11	7	11	12
Lynchburg	652	29.36	+.06	30.04	30.58	20	29.61	3	0.97	55.0	−1.0	84.9	23	67.2	32.1	11	43.9	52.8	36.3	22	9.9	10	61.6	40.1	1.39	−2.16	3,210	sw.	24	nw.	13	9	6	12	12
South Atlantic states.																																			
Kitty Hawk	22	30.06	+.05	30.05	30.55	20	29.55	4	1.00	54.3	+0.2	80.1	26	62.7	34.7	14	40.8	45.4	28.5	7	2.1	18	80.2	47.9	3.95	−1.81	10,126	ne.	44	n.	9	12	7	8	15
Hatteras	12	30.06	+.06	30.05	30.52	20	29.61	4	0.92	58.3	+2.0	76.0	26	65.9	38.0	15	51.8	38.0	26.1	15	4.4	18	78.4	51.0	3.16	−2.62	7,756	ne.	38	ne.	29	10	4	13	13
Fort Macon	11	30.06	+.06	30.04	30.52	20	29.61	3	0.91	58.9	+1.8	77.3	22	65.4	34.8	14	51.8	42.5	21.2	11	5.8	17	82.9	53.5	2.33	−1.92	10,219	sw.	35	n.	10	12	6	11	13
New River Inlet	....	....	....	....	....	...	....	...	......	......	....	......	...	......	......	...	......	......	......	...	......	...	......	......	....	....	....	....	...	....	...	...	...	...	...
Wilmington	52	30.02	+.05	30.05	30.51	20	29.63	3	0.88	61.8	+0.5	83.7	26	71.2	37.3	14	52.5	46.4	29.5	6	8.2	9	64.6	48.4	3.05	−0.31	5,545	sw.	27	w.	8	9	4	14	12
Smithville	34	30.04	+.05	30.05	30.51	20	29.63	3	0.88	59.2	−0.4	75.8	25	66.8	33.2	14	51.0	42.6	28.0	11	5.5	12	78.9	52.3	1.91	−1.57	7,359	sw.	28	sw.	8	9	5	11	14
Charlotte	808	29.23	+.08	30.06	30.54	20	29.67	3	0.87	59.4	+0.5	84.8	25	70.4	33.5	14	48.8	51.3	32.0	11	6.2	18	59.8	43.7	2.83	−2.01	4,499	sw.	23	nw.	13	9	8	8	14
Atlanta	1,129	28.91	+.06	30.07	30.46	20	29.80	3	0.66	61.1	+0.3	83.4	25	70.5	35.8	14	51.5	47.6	28.5	5	10.0	18	55.0	42.5	1.31	−4.51	7,439	nw.	30	nw.	4	10	7	12	11
Augusta	183	29.92	+.07	30.07	30.49	20	29.70	3	0.79	63.0	−1.0	92.8	25	77.6	35.1	14	51.4	57.7	37.9	11	11.0	18	63.7	47.6	1.68	−2.91	2,902	se.	20	n.	17	7	4	12	14
Charleston	52	30.02	+.05	30.04	30.45	20	29.64	3	0.82	63.8	−0.7	83.9	25	71.8	43.0	14	56.7	40.9	23.5	10	6.5	27	69.5	52.6	1.17	−3.75	5,746	sw.	36	ne.	19	6	1	17	12
Savannah	87	30.00	+.05	30.06	30.44	20	29.68	3	0.77	65.9	−0.4	86.7	25	74.3	42.0	14	57.4	44.7	25.0	17	6.5	18	66.5	53.0	1.14	−3.64	5,899	s.	31	ne.	19	6	2	15	13
Jacksonville	43	30.04	+.05	30.05	30.36	20	29.74	3	0.62	67.7	−1.8	87.8	27	77.2	46.8	14	59.9	41.0	20.2	24	5.9	19	73.8	58.2	1.24	−2.22	4,900	ne.	24	ne.	20	5	2	17	11
Cape Lookout	....	....	....	....	....	...	....	...	......	59.3	....	79.1	26	67.2	34.0	14	51.4	45.1	......	...	......	...	......	......	3.34	....	....	....	...	....	...	10	...	...	...
Portsmouth	....	....	....	....	....	...	....	...	......	59.3	....	75.0	25	65.8	40.0	11	52.8	35.0	......	...	......	...	......	......	....	....	....	....	...	....	...	...	...	...	...
Florida peninsula.																																			
Sanford	50	30.06	....	30.09	30.35	20	29.83	3	0.52	71.0	....	90.9	27	83.1	52.1	6	62.2	38.5	29.4	6	6.0	19	70.3	59.5	1.52	....	4,262	ne.	27	ne.	20	4	1	12	17
Cedar Keys	22	30.04	+.01	30.02	30.27	20	29.76	3	0.51	69.4	−1.1	82.3	29	70.9	50.5	14	63.4	31.8	25.2	14	6.0	3	72.8	59.6	0.15	−2.83	6,118	w.	43	s.	3	2	3	14	13
Key West	20	30.03	−.02	30.00	30.15	14	29.89	3	0.27	70.0	−0.9	86.4	30	81.8	67.4	16	71.9	19.0	16.8	16	4.8	13	74.5	67.0	0.47	−0.92	7,511	e.	32	ne.	21	4	3	17	10
Eastern Gulf states.																																			
Montgomery	219	29.84	+.04	30.04	30.38	20	29.77	3	0.61	65.8	+0.9	86.1	25	76.8	38.5	4	55.6	47.6	31.8	5	9.2	20	64.4	51.7	3.92	−2.54	4,203	nw.	20	nw.	3	8	4	17	9
Pensacola	30	30.04	+.03	30.03	30.31	20	29.78	3	0.53	67.0	−0.9	84.0	29	74.0	42.5	4	61.2	41.5	23.3	4	7.0	8	76.5	58.4	5.49	+0.49	5,913	se.	24	e.	21	6	2	10	12
Mobile	35	30.03	+.03	30.03	30.31	20	29.80	3	0.51	66.2	−0.8	86.1	29	74.1	39.9	4	59.1	46.2	20.9	5	5.3	19	70.4	57.7	5.24	−1.01	5,230	se.	21	se.	21	6	4	21	5
Vicksburg	244	....	....	....	....	...	....	...	......	......	....	......	...	......	......	...	......	......	......	...	......	...	......	......	....	....	....	....	...	....	...	...	...	...	...
New Orleans	52	29.98	+.03	30.00	30.27	13	29.83	30	0.45	70.5	+1.5	83.2	29	76.4	51.8	4	64.9	31.4	16.0	15	5.3	26	74.6	61.4	3.67	−2.68	5,742	se.	28	se.	21	10	6	17	7
Western Gulf states.																																			
Fort Smith	470	29.48	+.05	29.95	30.35	13	29.61	16	0.74	61.8	+1.9	84.4	15	73.6	40.0	3	52.2	44.4	34.6	10	8.5	6	74.7	52.9	7.63	+3.48	4,479	e.	26	e.	22	13	9	11	10
Little Rock	298	29.68	+.03	29.90	30.36	13	29.62	30	0.74	64.0	+1.3	85.8	17	73.8	39.9	4	53.8	45.9	30.1	5	8.5	20	67.9	51.9	6.03	−0.25	4,894	s.	24	n.	8	11	8	14	8
Shreveport	227	29.77	+.03	29.98	30.34	13	29.70	6	0.64	68.0	+2.2	92.4	18	79.2	48.7	4	58.6	43.7	33.3	9	7.8	6	66.0	54.7	7.07	+1.00	4,673	se.	27	ne.	11	15	6	17	7
Palestine	533	29.45	+.03	29.98	30.32	13	29.73	22	0.59	67.6	+1.2	86.2	17	77.4	47.3	13	58.8	38.9	27.1	9	7.6	6	73.7	57.2	5.14	+0.09	7,574	s.	40	ne.	11	11	9	14	7
Indianola	26	29.95	+.02	29.94	30.26	13	29.69	6	0.57	71.5	+1.6	86.1	17	78.2	59.2	20	66.1	26.9	21.0	9	6.0	12	84.4	66.2	5.19	+3.61	10,346	se.	56	e.	23	10	5	19	6
Galveston	40	29.97	+.03	29.97	30.28	13	29.74	6	0.54	71.9	+2.6	83.6	28	76.7	60.4	12	66.8	23.2	14.7	3	5.6	30	82.6	66.1	4.12	+0.61	8,555	s.	32	se.	23	6	9	14	7
San Antonio	....	29.14	....	....	....	...	....	...	0.53	68.8	−1.1	88.8	15	79.4	52.3	26	60.5	36.5	33.5	9	10.2	1	74.9	59.2	5.12	+2.03	7,052	se.	32	s.	29	15	14	12	4
Rio Grande valley.																																			
Rio Grande City	230	29.72	.00	29.87	30.11	12	29.59	22	0.52	77.9	+0.9	96.5	11	89.4	56.0	26	69.4	40.5	30.9	10	11.0	13	70.1	63.2	2.50	+1.62	5,988	se.	23	se.	21	5	6	17	7
Brownsville	57	29.89	+.02	29.90	30.11	13	29.68	6	0.43	74.6	0.0	90.8	28	83.9	59.0	4	69.0	31.8	21.0	9	8.6	5	84.4	69.1	0.67	+0.02	6,686	s.	38	nw.	19	9	11	15	4
Tennessee.																																			
Nashville	549	29.45	+.04	30.01	30.36	20	29.61	30	0.74	58.9	+2.9	82.1	23	69.8	34.0	13	49.9	48.1	34.9	5	10.2	24	65.8	46.5	3.75	−1.90	5,562	s.	28	w	11	10	9	16	5
Memphis	321	29.68	+.03	29.99	30.36	13	29.63	30	0.73	63.5	+2.3	83.8	17	73.1	35.2	4	55.1	48.6	27.2	29	7.5	6	61.1	48.4	3.00	−2.99	5,590	se.	34	nw.	3	12	7	14	9
Chattanooga	783	29.24	+.04	30.05	30.44	20	29.74	30	0.70	60.4	+0.7	81.8	23	70.4	35.0	14	51.4	46.8	33.3	5	5.1	7	68.3	48.7	1.60	−4.24	5,073	s.	29	nw.	28	7	4	14	12
Knoxville	980	29.04	+.04	30.06	30.46	20	29.74	30	0.72	57.5	+0.4	84.2	23	69.3	28.6	14	47.0	55.6	36.5	5	7.2	4	64.0	43.8	1.93	−3.85	4,568	w.	27	sw.	7	7	5	11	14
Ohio valley.																																			
Pittsburg	766	29.21	+.05	30.03	30.48	20	29.52	11	0.96	50.0	−0.2	89.2	23	61.1	24.9	9	39.2	64.3	37.0	25	4.9	18	60.4	34.9	2.79	+0.31	4,098	nw.	23	sw.	5	15	13	8	9
Columbus	805	29.16	+.05	30.04	30.43	20	29.53	11	0.90	49.5	−0.8	83.6	23	60.0	22.9	14	39.9	60.7	35.1	2	7.0	13	77.1	42.1	4.61	+1.63	6,171	sw.	32	nw.	11	15	11	14	5
Indianapolis	753	29.20	+.04	30.01	30.34	14	29.60	30	0.74	51.5	−0.7	78.3	22	61.3	27.8	4	43.9	50.5	28.5	5	7.2	18	69.1	40.9	5.28	+1.84	5,209	s.	23	nw.	11	13	12	14	4
Greencastle	....	29.06	....	30.00	30.32	14	29.58	30	0.74	51.0	....	77.4	22	60.4	25.9	4	42.7	51.5	31.6	29	6.5	18	71.1	41.2	4.61	....	6,949	n.	28	s.	23	15	10	17	3
Cincinnati	628	29.37	+.05	30.03	30.40	14	29.58	11	0.81	52.5	−1.8	81.9	23	63.3	27.0	14	44.0	54.3	36.5	3	5.2	18	68.6	41.3	3.34	+0.12	5,563	se.	30	sw.	2	15	11	12	7
Louisville	530	29.44	+.04	30.02	30.38	20	29.60	30	0.77	57.7	+1.9	83.2	23	68.3	31.5	13	48.0	51.7	31.0	15	7.1	7	67.7	46.3	4.94	+0.37	5,886	se.	28	w.	28	14	10	15	5
Lower lake region.																																			
Detroit	661	29.32	+.06	30.04	30.40	19	29.43	11	0.96	45.1	0.0	77.0	23	54.1	20.3	9	36.9	56.7	26.7	29	6.9	12	70.5	35.7	1.83	−0.48	7,749	ne.	30	s.	7	12	9	16	5
Toledo	651	29.33	+.06	30.03	30.36	19	29.44	11	0.92	46.0	−0.9	80.0	23	54.6	21.8	4	37.5	58.2	28.3	29	6.0	17	72.2	30.7	2.41	+0.14	6,911	ne.	32	ne.	17	15	9	18	3
Sandusky	639	29.35	+.06	30.04	30.38	20	29.48	11	0.91	44.9	−2.4	83.9	23	54.0	24.4	4	37.7	59.5	31.7	29	5.0	17	71.0	35.3	2.19	−0.38	9,532	e.	46	nw.	28	14	12	14	4
Cleveland	690	29.30	+.06	30.05	30.42	20	29.49	11	0.93	44.0	−1.2	83.3	23	54.0	23.1	14	30.9	60.2	33.7	2	6.9	9	70.6	30.4	2.52	+0.08	7,728	w.	31	n.	28	14	7	17	6
Erie	681	29.30	+.06	30.04	30.44	20	29.48	11	0.96	44.3	−0.8	84.1	23	53.2	21.7	14	36.0	62.4	33.7	28	8.0	4	70.1	34.6	2.25	−0.27	7,892	w.	36	w.	28	11	9	13	8
Buffalo	690	29.29	+.09	30.05	30.50	19	29.52	5	0.99	39.9	−1.5	81.5	23	48.7	20.2	5	32.7	61.3	30.4	24	3.7	12	76.9	32.6	3.47	+1.25	7,423	sw.	44	sw.	26	13	12	10	8
Rochester	621	29.36	+.08	30.04	30.53	19	29.48	5	1.05	41.4	−1.6	90.0	23	52.5	19.9	9	33.1	70.1	34.8	23	5.3	12	74.2	33.0	2.96	+0.44	8.596	nw.	38	w.	26	11	11	10	9
Oswego	334	29.66	+.06	30.03	30.54	19	29.49	28	1.06	38.5	−3.9	85.0	23	46.5	17.3	9	30.6	67.7	32.8	23	5.9	4	72.6	29.9	1.86	−0.14	7,968	w.	34	n.	28	11	9	11	10
Upper lake region.																																			
Duluth	644	29.27	+.01	30.03	30.37	13	29.46	7	0.91	35.8	−1.2	71.7	29	46.3	4.6	8	27.8	67.1	37.9	28	3.9	20	64.7	25.0	0.89	−1.27	5,378	e.	32	ne.	1	8	6	18	6
Marquette	673	29.28	+.03	30.04	30.42	1	29.47	7	0.94	34.9	−2.1	76.2	21	44.1	10.0	3	20.7	66.2	30.8	21	3.7	11	73.3	20.5	1.96	+0.26	5,606	nw.	28	s.	6	13	11	7	12
Escanaba	612	29.34	+.03	30.03	30.37	1	29.48	7	0.89	35.2	−0.6	54.4	29	43.3	10.0	3	26.7	44.4	29.1	3	6.8	11	67.8	25.0	3.16	+1.32	7,102	n.	30	n.	2	18	13	12	5
Milwaukee	697	29.26	+.04	30.03	30.35	1	29.53	10	0.82	40.4	−1.5	77.2	21	48.3	21.6	8	33.8	55.6	28.0	20	4.9	12	77.4	33.3	2.32	−0.69	8,960	n.	34	nw.	7	11	13	14	3
Chicago	661	29.29	+.03	30.01	30.32	13	29.54	10	0.78	45.3	−0.4	76.0	21	53.7	27.0	13	38.7	49.0	27.8	2	6.7	3	76.4	38.0	4.00	+0.40	6,293	n.	24	n.	2	16	8	19	3
Grand Haven	620	29.31	+.04	30.02	30.33	19	29.51	11	0.82	42.7	−0.6	73.0	21	50.7	25.2	14	36.3	47.8	29.2	23	5.5	11	72.4	34.0	1.38	−1.34	9,101	nw.	35	nw.	28	15	9	19	2
Mackinaw City	605	29.37	+.05	30.05	30.42	1	29.50	5	0.92	34.9	−1.7	78.6	22	43.6	6.6	4	26.0	72.0	40.7	22	7.2	12	75.8	27.8	1.88	....	6,925	nw.	32	sw.	29	15	10	12	8
Alpena	609	29.34	+.03	30.04	30.42	19	29.47	5	0.91	34.7	−1.5	79.0	21	45.3	9.4	9	27.2	69.6	43.0	21	3.8	11	78.0	28.1	2.28	+0.46	7,349	se.	31	w.	5	13	9	15	6
Port Huron	633	29.34	+.06	30.04	30.40	19	29.46	11	0.94	39.3	−1.0	79.6	23	48.7	15.5	14	32.1	64.1	30.2	29	4.5	16	76.5	31.9	1.26	−0.99	6,376	s.	36	nw.	28	10	7	14	9

Table of miscellaneous meteorological data for April, 1885—Signal Service observations—Continued.

Stations.	Elevation above sea-level.	Atmospheric pressure (in inches and hundredths).								Temperature of the air (in degrees Fahrenheit).														Mean rel. humidity.	Mean dew-point.	Precipitation.	Departure from normal	Winds.						No. of rainy days.	No. of cloudy days.	No. of fair days.	No. of clear days.
		Mean actual barometer.	Departure from normal.	Mean reduced barometer.	Extremes.				Monthly range of barometer.	Monthly mean.	Departure from normal.	Extremes.						Monthly range.	Daily ranges.									Total movement.	Prevailing direction.	Max. velocity.							
					Highest barometer	Date.	Lowest barometer	Date.				Max.	Date.	Mean max	Min.	Date.	Mean min		Greatest.	Date.	Least.	Date.							Miles p.hr	Direction.	Date.					
Extreme northwest.																																			
Fort Buford	1,930	27.91	—.02	30.02	30.36	11	29.50	6	0.87	43.5	+ 3.0	75.0	5	57.7	18.8	7	32.8	56.2	42.5	5	8.7	18	67.1	31.5	1.71	+0.45	8,446	nw.	50	w.	6	12	11	14	5
Bismarck	1,694	28. 2	—.03	30.00	30.57	25	29.47	6	1.09	42.8	+ 2.6	71.6	3	54.1	18.7	7	33.3	52.9	38.8	28	4.0	20	75.0	34.2	3.21	+0.35	6,666	n.	36	s.	13	10	6	14	10
Fort Yates																																			
Fort Totten		28.30							0.80	39.8		73.9	6	51.7	13.7	7	32.1	00.2	40.3	6	3.0	21	77.4	32.3	3.07		8,309	nw.	54	nw.	7	10	9	11	3
Moorhead	923	28.94	—.06	29.98	30.38	12	29.34	22	1.03	40.7	+ 1.9	67.5	4	52.2	13.9	2	32.1	53.6	38.5	4	0.2	20	75.9	33.2	3.43	+1.43	0.273	n.	40	nw.	7	9	8	15	7
Saint Vincent	804	29.10	—.06	30.02	30.45	12	29.34	22	1.11	36.7	+ 2.1	65.2	28	47.2	—14.4	2	27.0	79.6	42.9	2	5.3	21	78.6	30.2	2.85	+1.85	8,899	s.	41	nw.	7	12	10	11	9
Upper Mississippi valley.																																			
Saint Paul	801	29.10	+.02	29.98	30.31	13	29.54	7	0.77	45.3	0.0	75.5	21	57.8	19.6	8	37.5	55.9	35.0	7	11.5	16	76.8	38.0	3.19	+1.10	6,656	s.	40	s.	21	10	11	15	4
La Crosse	725	29.20	+.03	29.98	30.32	13	29.55	7	0.77	45.7	— 1.2	73.7	21	52.9	21.6	8	36.8	52.1	37.3	7	3.8	16	68.4	35.1	1.85	—0.19	6,692	s.	32	n.	11	12	11	10	3
Dubuque	665	29.28	.....	29.99	30.34	13	29.03	10	0.72	47.2	— 0.8	73.9	21	55.8	25.4	8	39.0	48.5	28.4	27	5.4	16	70.8	37.5	3.69	+0.76	4,276	s.	18	s.	14	16	14	14	2
Davenport	615	29.34	+.04	30.00	30.36	13	29.02	10	0.75	49.4	+ 0.2	74.0	21	58.0	28.1	8	41.9	45.9	25.8	6	5.1	16	72.0	40.3	2.47	+0.00	7,542	nw.	30	sw.	21	15	15	15	0
Des Moines	849	29.08	+.03	29.99	30.36	13	29.66	7	0.70	48.9	— 0.4	76.5	27	59.6	26.2	8	40.8	50.3	35.4	4	0.4	17	75.2	40.9	3.62	+0.98	4,079	s.	26	s.	21	19	15	12	3
Keokuk	618	29.32	+.04	29.93	30.36	13	29.66	30	0.70	49.7	— 1.8	76.9	21	58.0	28.0	8	41.9	48.9	29.6	4	5.8	17	76.1	41.8	3.33	+0.23	7,308	s.	31	se.	14	13	12	14	4
Springfield	644	29.32	+.03	29.91	30.35	13	29.58	30	0.77	51.7	— 1.3	76.2	21	60.3	30.0	8	43.1	46.2	30.2	5	7.0	3	08.0	40.7	6.36	+3.17	7,577	s.	28	n.	2	15	10	15	5
Saint Louis	583	29.40	+.04	30.00	30.38	13	29.56	30	0.82	50.4	+ 1.2	79.0	21	65.7	32.1	8	48.2	46.9	31.8	7	6.2	18	66.9	44.5	4.84	+1.43	9,339	s.	30	nw.	7	14	12	11	7
Cairo	377	29.04	+.03	30.00	30.38	13	29.54	30	0.84	59.7	+ 1.4	81.0	22	69.5	34.0	4	51.6	47.0	34.0	3	7.0	9	01.7	45.7	1.43	—2.89	8,075	se.	38	se.	17	10	8	17	5
Missouri valley.																																			
Fort Bennett	1,510	28.35	.....	29.99	30.39	12	29.42	21	0.97	47.0	+ 4.4	78.5	4	62.3	18.9	9	35.7	59.6	51.1	9	6.3	20	62.0	34.2	1.84	—0.44	7,834	n.	42	s.	13	7	6	15	9
Fort Sully										51.2		80.5	4	65.0	21.0	9	37.4	59.5							2.38						9				
Yankton	1,228	28.66	+.02	30.00	30.34	12	29.50	21	0.84	47.2	+ 2.0	76.7	4	60.7	19.2	8	30.7	57.5	42.0	3	12.0	16	69.5	36.6	5.08	+1.98	6,436	n.	41	n.	7	11	5	19	6
Huron	1,305	28.56	.00	30.01	30.42	12	29.42	2	1.02	45.9	+ 2.3	75.3	4	59.7	17.9	8	34.4	57.4	45.7	4	0.5	27	62.5	34.6	1.06	—1.61	8,198	se.	33	se.	13	10	6	13	11
Omaha	1,113	28.50	+.02	29.98	30.35	13	29.62	21	0.73	50.1	+ 0.5	77.2	5	59.9	28.0	8	42.1	49.2	33.3	1	7.2	21	72.2	40.8	6.34	+2.99	7,767	n.	38	nw.	10	15	11	14	5
Leavenworth	842	29.09	+.03	29.93	30.40	13	29.62	16	0.78	52.7	— 0.8	77.0	20	62.7	30.0	13	44.9	47.0	39.0	10	7.0	21	74.7	44.2	6.63	+2.98	4,490	s.	31	s.	14	16	9	15	6
Lamar		28.92	.....	30.00	30.39	13	29.62	16	0.77	55.4	.....	79.4	15	66.8	31.4	3	45.9	48.0	39.1	10	7.2	22	68.9	43.8	6.64	.....	9,123	s.	4	se.	22	11	9	18	3
Northern slope.																																			
Fort Assinaboine	2,710	27.12	+.01	30.04	30.39	11	29.53	5	0.86	45.2	+ 3.8	78.4	5	58.5	17.5	7	33.8	60.9	44.7	5	7.4	20	66.4	33.5	0.38	—0.51	6,385	sw.	42	nw.	6	5	6	13	11
Fort Benton	2,700	27.19	.....	30.05	30.39	11	29.57	5	0.82	45.9	+ 3.1	79.3	5	61.1	20.5	19	33.5	58.8	45.0	25	9.5	20	55.4	29.3	0.64	—0.26	4,878	sw.	46	nw.	24	8	8	11	11
Fort Shaw	3,550	26.30	.....	29.98	30.31	11	29.55	5	0.76	45.0	+ 5.5	76.5	29	58.2	17.4	19	32.2	59.1	49.3	12	9.9	22	52.5	26.9	0.60	—0.11	5,750	w.	36	w.	15	5	7	11	12
Helena	4,044	25.77	—.01	29.98	30.30	11	29.60	15	0.70	45.7	+ 4.3	69.3	30	56.0	22.1	18	37.1	47.2	33.2	12	7.5	17	55.7	29.1	1.00	—0.26	5,053	sw.	36	w.	24	6	8	10	6
Fort Custer	3,040	26.79	+.01	29.97	30.32	11	29.54	0	0.77	46.2	+ 2.0	70.3	5	60.	22.0	12	31.6	54.3	44.2	5	8.3	21	60.4	30.5	0.50	—0.66	5,518	n.	36	n.	15	8	8	16	6
Fort Maginnis	4,340	25.52	.....	30.02	30.30	11	29.04	15	0.60	41.5	.....	71.8	5	53.3	19.2	18	30.5	52.8	39.8	12	8.4	17	58.5	27.2	1.00	.....	7,528	w.	52	n.	0	12	6	14	10
Deadwood	4,600	25.32	+.03	30.01	30.30	12	29.65	6	0.64	41.3	+ 1.7	65.1	5	51.0	21.2	23	33.5	43.9	31.1	28	7.7	19	70.5	31.5	3.11	—1.94	3,276	ne.	18	ne.	0	14	3	14	13
Cheyenne	6,089	23.93	+.01	29.94	30.21	11	29.55	21	0.66	40.7	+ 1.0	65.4	10	53.0	18.7	24	31.2	46.7	34.4	9	10.7	23	68.0	29	3.77	+2.70	7,706	nw.	40	nw.	8	12	6	13	9
North Platte	2,841	27.00	+.01	29.94	30.31	12	29.40	21	0.91	51.3	+ 3.9	75.0	26	63.0	30.5	12	40.9	44.5	30.5	4	12.0	11	64.8	38.6	1.59	—0.25	7,287	se.	48	s.	21	10	6	18	6
Middle slope.																																			
Denver	5,294	24.67	+.02	29.93	30.27	11	29.53	21	0.74	45.7	— 0.7	71.2	10	58.4	17.6	24	35.4	53.6	36.9	9	7.3	23	61.7	30.7	4.94	+3.11	5,154	n.	40	nw.	8	13	12	11	7
Pike's Peak	14,134	17.71	.....	29.98	30.21	9	29.45	21	0.67	15.8	+ 3.2	28.2	10	21.5	— 4.6	22	11.1	32.8	20.0	22	4.8	15	88.9	13.0	5.39	+2.07	15,012	w.	80	w.	8	21	10	13	7
Dodge City	2,517	27.33	+.02	29.93	30.32	12	29.52	6	0.81	54.4	+ 1.5	79.0	10	68.2	32.8	24	43.2	46.2	40.2	1	7.5	24	61.4	38.7	1.39	—0.15	11,323	se.	03	se.	20	9	3	10	11
West Las Animas	3,905	25.92	+.01	29.85	30.14	28	29.43	21	0.72	53.2	+ 4.8	81.6	10	69.7	25.8	22	39.0	55.8	45.8	9	8.2	23	52.4	33.1	0.45	—0.54	7,241	w.	40	n.	21	5	6	16	8
Fort Elliott	2,650	27.8	.00	29.94	30.27	12	29.56	6	0.71	50.0	+ 0.5	81.6	1	09.1	32.3	25	45.5	49.3	39.3	25	6.7	23	64.0	45.1	4.67	+3.93	9,795	s.	51	s.	21	9	3	18	9
Fort Reno										59.4		87.7	15	71.9	36.5	3	46.9	51.2							2.88						8				
Southern slope.																																			
Fort Sill	1,200	28.68	—.02	29.89	30.22	12	29.55	6	0.67	60.6	— 1.8	87.0	15	73.2	37.2	8	50.6	49.8	39.0	10	9.0	22	70.0	48.7	2.62	+0.18	10,107	s.	80	sw.	21	10	7	11	12
Fort Concho	1,900	28.04	+.01	29.95	30.22	12	29.69	6	0.53	64.7	— 0.3	90.5	11	79.1	43.1	25	54.2	47.4	39.2	17	13.2	18	70.8	53.5	4.16	+2.18	7,755	s.	36	ne.	11	9	6	15	9
Fort Stockton	3,010	26.93	+.01	29.93	30.13	12	29.72	20	0.41	65.4	+ 2.1	91.0	11	81.5	42.0	23	52.1	49.0	42.0	23	17.0	13	58.0	48.8	0.73	+0.26	7,568	s.	40	se.	13	8	1	12	7
Fort Davis	4,928	25.13	.....	29.88	30.07	8	29.72	21	0.35	61.6	+ 1.0	84.3	11	75.9	37.3	23	49.6	47.0	36.0	1	13.3	12	44.5	36.7	0.46	—0.14	5,818	sw.	33	sw.	20	6	3	16	11
Southern plateau.																																			
Fort Verde			.....							61.8	+ 2.9	87.0	10	76.5	38.5	24	47.0	48.5	.....	.....	.....	.....	.....	.....	0.69	—0.01	.....	.....	.....	.....	.....	3	.....	.....	.....
Prescott	5,389	24.67	+0.1	29.92	30.16	8	29.65	20	0.51	51.6	+ 2.8	80.0	10	65.3	28.5	24	38.9	51.5	39.7	25	15.8	23	55.7	34.2	0.62	—0.30	6,735	s.	35	s.	20	4	0	15	15
Wickenburg			.....							62.9	+ 2.8	94.0	11	80.9	34.5	21	45.0	59.5	.....	.....	.....	.....	.....	.....	0.57	+0.00	.....	.....	.....	.....	.....	3	.....	.....	.....
Phoenix			.....							65.0	— 1.4	98.6	14	89.6	30.2	24	40.5	64.8	.....	.....	.....	.....	.....	.....	0.00	—0.40	.....	.....	.....	.....	.....	0	.....	.....	.....
Fort Grant	4,856	25.17	.....	29.87	30.10	8	29.73	20	0.37	57.8	+ 0.2	81.7	10	72.6	30.2	21	48.2	45.5	33.1	26	16.6	15	40.9	32.3	0.04	—0.21	5,268	n.	28	w.	12	1	1	9	20
Fort Thomas	2,710	27.15	.....	29.85	30.10	8	29.68	20	0.42	60.6	+ 1.1	88 0	10	77.6	29.3	21	43.9	58.7	48.2	25	16.9	15	45.1	35.5	0.14	—0.15	.....	w.	.....	.....	.....	1	1	0	23
Fort Apache	5,050	24.98	+.01	29.88	30.00	8	29.71	20	0.35	53.3	+ 3.5	81.5	11	69.6	24.2	21	37.1	57.3	44.2	24	19.0	4	49.4	32.4	0.52	—0.30	5,648	ne.	34	s.	28	3	2	12	16
San Carlos			.....							.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Bowie			.....							60.5		83.0	11	73.0	23.0	20	48.0	65.0	.....	.....	.....	.....	.....	.....	0.00	.....	.....	.....	.....	.....	.....	0	.....	.....	.....
Maricopa			.....							.....		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willcox			.....							59.1		90.0	10	79.0	22.0	21	39.2	68.0	.....	.....	.....	.....	.....	.....	0.03	.....	.....	.....	.....	.....	.....	2	.....	.....	.....
El Paso	3,704	26.19	.00	29.90	30.12	8	29.65	20	0.47	63.6	+ 0.6	89.8	11	81.5	37.6	23	50.2	52.2	45.6	25	22.4	26	29.8	27.1	0.04	—0.19	3,949	w.	30	sw.	20	3	4	14	12
Santa Fé		23.21	+.06	29.96	30.18	9	29.64	20	0.53	45.8	— 0.4	70.0	10	57 2	23.0	24	36.2	46.0	30.0	9	14.0	22	57.1	30.2	1.38	+0.81	5,646	n.	32	s.	20	13	7	10	7
Keeler, Cal		26.22	.....						0.64	57.8	.....	77.8	11	70.1	30.6	20	46.3	41.2	30.5	24	10.7	27	54.3	39.5	0.82	.....	5,378	sw.	38	nw.	20	0	2	14	14
Middle plateau.																																			
Salt Lake City	4,348	25.54	—.01	29.90	30.21	9	29.67	17	0.54	52.4	+ 3.2	72.4	12	62.3	34.3	23	44.7	38.1	29.3	25	7.1	22	63.7	38.2	3.47	+1.03	3,006	nw.	26	sw.	16	15	7	14	7
Winnemucca		25.56	—.00	29.96	30.26	9	29.61	26	0.65	49.7	+ 2.3	73.9	10	62.0	24.5	23	37.0	49.4	41.5	24	11.8	14	54.9	31.9	1.00	—0.03	5,615	sw.	39	sw.	16	7	3	11	16
Fort Bidwell			.....							53.2		75.5	1	64.4	29.5	18	42.0	40.0	.....	.....	.....	.....	.....	.....	3.45	.....	.....	.....	.....	.....	.....	12	.....	.....	.....
Fort Bridger			.....							42.3		62.7	10	53.0	21.4	4	31.0	41.3	.....	.....	.....	.....	.....	.....	1.49	.....	.....	.....	.....	.....	.....	19	.....	.....	.....
Montrose		24.22	.....	29.97	30.22	9	29.65	20	0.57	45.7	.....	73.0	12	59.6	26.6	21	37.2	46.4	35.0	12	9.0	23	68.8	34.1	1.86	.....	5,401	e.	40	w.	19	20	9	18	3
Northern plateau.																																			
Dayton	1,667	28.24	.....	30.00	30.24	23	29.72	14	0.52	50.7	+ 1.8	78.5	30	67.4	22.3	20	37.2	56.2	42.0	20	17.9	15	55.3	33.5	0.06	—3.03	4,139	sw.	22	sw.	15	4	0	14	16
Lewiston	780	29.16	.....	29.96	30.25	23	29.58	14	0.67	54.3	+ 3.5	81.4	30	69.4	30.6	18	40.8	50.8	37.7	9	14.5	17	53.5	35.4	0.19	—1.13	1,960	nw.	25	nw.	6	3	0	20	20
Spokane Falls	1,910?	27.95	+.03	30.02	30.26	2	29.00	14	0.66	50.8	+ 3.4	75.0	30	63.1	28.4	7	37.5	46.6	37.0	28	13.1	17	68.0	40.1	0.27	—1.55	3,637	sw.	26	nw.	21	3	1	10	19
Cœur d'Alene			.....							48.2		73.0	29	63.0	22.0	19	33.4	51.0	.....	.....	.....	.....	.....	.....	0.00	.....	.....	.....	.....	.....	.....	0	.....	.....	.....
Boisé City	2,750	27.09	.....	29.93	30.23	9	29.62	26	0.60	57.2	+ 2.5	74.0	30	65.2	28.3	19	40.9	45.7	31.6	9	9.8	22	56.0	36.0	0.09	—1.10	3,673	nw.	27	nw.	22	3	1	10	19
Lake View			.....							48.1		76.0	10	61.4	19.0	18	34.9	57.0	.....	.....	.....	.....	.....	.....	0.82	.....	.....	.....	.....	.....	.....	8	.....	.....	.....
Ashland			.....							54.3		84.0	10	70.8	25.0	18	37.9	59.0	.....	.....	.....	.....	.....	.....	1.52	.....	.....	.....	.....	.....	.....	10	.....	.....	.....
North Pacific coast region																																			
Astoria			.....							50.6		71.0	28	57.3	35.0	19	44.0	36.0	.....	.....	.....	.....	.....	.....	1.03	.....	.....	.....	.....	.....	.....	7	.....	.....	.....
Olympia	36																																		
Portland	67	29.96	+.07	30.04	30.32	21	29.67	16	0.65	53.1	+ 1.4	82.0	28	68.5	34.8	19	41.5	47.2	40.0	28	15.0	16	63.3	39.3	1.12	—2.37	2,396	nw.	18	nw.	14	6	3	8	19
Roseburg	511	29.48	+.04	30.04	30.36	21	29.66	26	0.70	53.0	+ 2.3	81.9	10	68.0	31.4	18	40.5	50.5	40.4	7	13.8	15	68.2	41.3	1.21	—1.79	1,885	n.	20	sw.	16	7	4	13	13
Fort Canby	179	29.88	.....	30.08	30.36	21	29.75	16	0.61	48.9	.....	70.0	27	54.4	36.6	17	44.0	33.4	19.0	27	2.6	21	85.0	44.1	1.12	.....	4,863	n.	24	s.	11	9	7	13	10
Port Angeles		30.04	.....						0.53	45.2	.....	66.9	20	55.2	29.7	7	35.8	37.2	29.5	27	7.1	13	84.8	40.6	0.71	.....	*3,045	s.	30	w.	14	5	3	8	19
Tatoosh Island		29.97	.....	30.07	30.32	9	29.77	16	0.55	47.3	.....	63.0	27	52.7	37.5	18	43.0	25.5	17.0	27	3.8	12	83.2	42.1	0.37	.....	6,709	sw.	56	w.	14	5	8	12	10
Pysht			.....							46.1		67.0	11	55.0	30.7	7	30.7	37.0	.....	.....	.....	.....	.....	.....	1.13	.....	.....	.....	.....	.....	.....	7	.....	.....	.....
Mid. Pacific coast region																																			
Cape Mendocino	637	29.32	.....	30.00	30.16	21	29.58	26	0.58	50.8	.....	68.9	9	56.3	39.0	17	46.1	29.9	23.7	23	4.0	3	84.1	45.9	0.92	.....	11,471	n.	48	se.	10	8	5	14	11
Red Bluff	332	29.62	—.01	29.96	30.21	1	29.49	25	0.72	62.0	+ 3.3	84.0	25	73.1	34.0	18	51.5	49.5	33.5	24	13.0	2	61.1	40.1	0.62	—2.47	4,488	s.	28	n.	26	6	4	17	9
Sacramento	65	29.91	—.03	29.96	30.20	1	29.52	26	0.68	60.6	+ 2.8	83.0	25	71.3	39.0	19	51.5	44.0	31.0	25	10.0	28	71.1	50.5	0.68	—3.11	5,069	s.	23	s.	6	7	4	12	14
San Francisco	60	29.94	—.05	29.99	30.20	1	29.61	26	0.60	57.1	+ 2.6	75.0	9	63.2	47.0	18	53.1	28.0	20.0	23	6.0	2	77.0	49.5	3.17	+1.05	6,836	w.	32	nw.	30	11	9	14	7
South Pacific coast region																																			
Los Angeles	371	29.62	—.04	29.97	30.18	1	29.77	26	0.41	61.9	+ 4.1	88.6	9	74.2	44.8	4	52.5	43.8	36.9	24	7.9	14	69.6	50.3	2.01	+0.01	4,311	w.	28	w.	20	8	7	12	11
San Diego	67	29.92	—.04	29.96	30.14	1	29.75	26	0.39	62.0	+ 4.2	82.8	9	69.7	47.1	22	55.2	35.7	26.8	24	6.9	16	75.6	53.7	1.20	+0.36	3,647	w.	25	w.	20	6	5	12	13
Yuma	141	29.73	—.02	29.86	30.10	8	29.58	26	0.52	70.7	0.0	96.4	10	84.5	50.0	21	58.0	45.8	36.1	25	12.5	3	51.0	50.4	0.07	—0.02	5,646	nw.	48	nw.	20	1	0	14	16

* Record for twenty-four days. † Observation for twenty-three days.

The following reports referring to the display of the 7–8th, are given:

7th.—Eastport, Maine: a brilliant auroral arch formed at 9.15 p. m., the display continuing until early morning of the 8th. A few streamers were observed between 12.15 and 1.00 a. m.

7th.—Saint Vincent, Minnesota: an aurora was observed at 9.50 p. m. extending from 165° to 250° azimuth; it consisted at first in a poorly-defined arch of 25° altitude, which, at 11 p. m., disappeared, when bright streamers shot upwards; the display continued until 3.25 a. m. of the 8th.

7th.—Moorhead, Minnesota: a faint aurora, with streamers, was observed in the northern sky from 10 p. m. until midnight.

7th.—Bismarck, Dakota: brilliant auroral streamers appeared at 9.30 p. m. on the northwestern horizon and extended to the zenith; at 10 p. m. the whole of the northern sky was covered with a brilliant sheet of light, except a dark segment rising 5° above the horizon. The display ended at 4 a. m. of the 8th; no streamers were observed after midnight.

7th.—Fort Totten, Dakota: an aurora was observed in the north, altitude 25°, azimuth 120°, it consisted of a pale light resembling twilight lasting from 9.30 p. m. until early morning of the 8th, no arch or beams were visible.

7th.—Saint Paul, Minnesota: a faint auroral arch, extending over 35° of the sky, was visible at 11.05 p. m.; at 11.20 p. m. the arch became brighter and a dark, slate-colored segment appeared beneath it. The altitude of the arch was about 25°; the display remained visible at midnight.

7th.—La Crosse, Wisconsin: an aurora was observed at 9.30 p. m.; it consisted in slender, luminious beams rising to various heights not exceeding 30°; the display continued until 2.15 a. m. of the 8th.

7th.—Huron, Dakota: a faint aurora, in the form of an arch, was visible from 10.15 p. m. until after midnight.

7th.—Spokane Falls, Washington Territory: an aurora was observed from 11.30 p. m. of the 7th until 4 a. m. of the 8th; it appeared as a bright light, the limit of which was poorly defined; altitude about 25°; azimuth about 45°; there were no streamers.

7th.—Port Angeles, Washington Territory: an aurora was observed at 11 p. m.; the dark segment was well-defined and extended to a height of 10° above the horizon. A low arch of yellowish color extended from 15° west of north to about 50° east of north; the apex of the arch was in the direction of the magnetic pole; faint streamers were also observed.

7th.—Pysht, Washington Territory: an aurora was observed at 9 p. m.; it consisted of a pale light above a dark base; the display ended at 10 p. m.

7th.—Tatoosh Island, Washington Territory: an aurora was observed from 12.05 to 2.10 a. m. of the 8th; it consisted of an arch of bluish light, extending over 45° of the horizon and to an altitude of about 30°; it was clearly defined, with a dark segment beneath.

7th.—Cresco, Iowa: faint auroral light in the north-northeast at 9.30 p. m.

7th.—Prairie du Chien, Wisconsin: a bright auroral arch of about 25° altitude was visible from 10 p. m. until 2 a. m. of the 8th.

7th.—Chester, Minnesota: from 10 p. m. until midnight; Independence, Iowa, Northfield, Minnesota, Madison, Wisconsin, at 10 p. m.

Auroral displays were reported on other dates as follows:

3–4th.—Wauseon, Ohio, faint.

6th.—Saint Vincent, Minnesota, faint auroral light in the north at 10 p. m.

8th.—Embarras, Wisconsin, and Manchester, Iowa.

9th.—Tiffin, Ohio, at 9 p. m.

10th.—Saint Vincent, Minnesota, from 10.25 to 11.40 p. m., faint, narrow belt of white light.

12th.—Saint Vincent, Minnesota, at 9 p. m., continuing throughout the night; irregular arch of pale, whitish color with a few rays shooting up at intervals; it extended from 110° to 250° azimuth. Monticello, Iowa, aurora observed at 9 p. m.; no streamers were visible.

13th.—Escanaba, Michigan, at 9.11 to 11.25 p. m., faint. Manistique, Michigan, at 8.10 p.m. Blackwell, North Carolina, faint,

14th.—Portland, Maine, faint auroral arch from 10.30 p. m. until after midnight. Eastport, Maine, auroral arch from 10 p. m. until 1.15 a. m. of the 15th; it was of a straw color and about 20° altitude. Gardiner, Maine, an aurora was visible from 10 p. m. until morning; it consisted of shooting beams above a low arch, with dark cloud below; the display was brighter at 3.15 a. m. of the 15th. Cambridge, Massachusetts, a low auroral arch was visible at 10.30 p. m., and later a dark cloud appeared below the arch.

15th.—Manhattan, Kansas, from 2 a. m. until daylight.

20th.—Philadelphia, Pennsylvania, a bright auroral arch reaching an altitude of 15°, was observed in the northwest at 3 a. m.; it continued until daybreak. Similar displays were observed on the 21st and 22d.

27th.—Moorhead, Minnesota, a faint aurora was observed from 10.30 p. m. until midnight. Fort Totten, Dakota, shooting beams of yellowish light were observed in the northern sky from 10 to 11.50 p. m. Tatoosh Island, Washington Territory, an aurora was observed at 7 a. m., (3.41 local time) extending over 30° of the horizon and to a considerable altitude; the lower part of the light was of a deep red color, changing gradually to a faint white at the upper limit; occasional streamers were observed.

ELECTRICAL PHENOMENA.

Fort Sully, Dakota: the telegraph line between this place and Bismarck was sensibly affected by atmospheric electricity on the 3d.

Fort Assinaboine, Montana, 15th: atmospheric electricity interrupted telegraphic communication from 12.01 to 1.50 p. m.

Yuma, Arizona, 19th: during a gale on this date the atmosphere was highly charged with electricity. The telephone bells rang constantly and long flashes were emitted from the switch board.

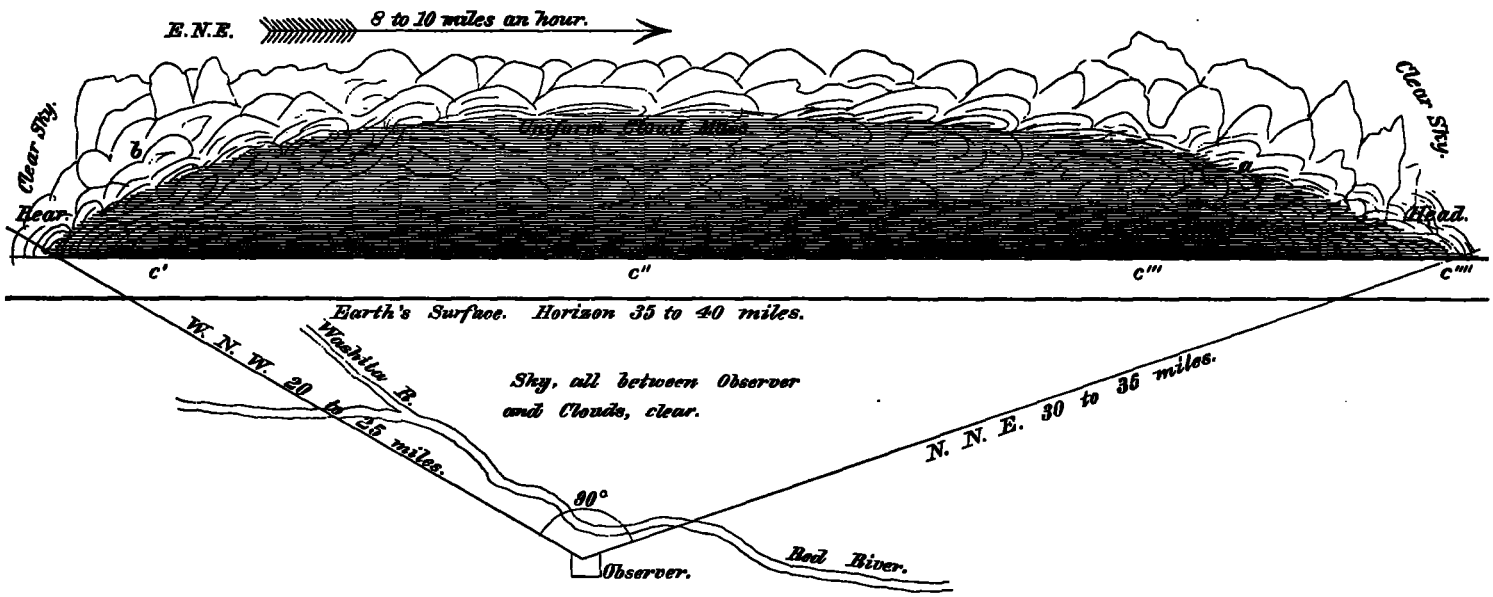
Mr. T. V. Munson, of Denison, Grayson county, Texas, has rendered an interesting account of a display of atmospheric electricity which was observed near that place between 9 p. m. on the 29th and 2 a. m. on the 30th. The accompanying illustration is as given by the observer without correcting the apparent discrepancies, as there was no time for the author to revise the same.

The following is a description of the phenomenon given as nearly as possible in the language of the observer: "My residence stands on the south bluff of Red river and commands a view which extends from thirty to fifty miles into Indian Territory; at noon on the 29th, the weather having been cloudy and hazy with little wind, a brisk breeze sprung up, blowing at the rate of ten or twelve miles per hour from the southeast and continued until 6 p. m. when it abated somewhat; occasional flashes of lightning were observed from cumulus clouds in the southeast, north and northwest, which moved in a northeasterly direction. The whole day the main clouds had been moving in broken masses towards the northeast and above them were light feathery, spraylike clouds drifting in the opposite direction. Toward evening the clouds, moving to the northeast, gathered into long lines of the cumulo-stratus kind with belts of clear sky between.

At 9 p. m. I noticed, beyond the boundary of Indian Territory, a heavy cloud, subtending a right angle from my point of view, the head of the cloud in the north-northeast being about thirty or thirty-five, and the rear in the northwest about twenty or twenty-five miles from my place of observation, as near as I could estimate.

The cloud was about from thirty-five to forty miles in length, with a depth of at least one mile, and moved at the rate of eight or ten miles an hour.

The following is an illustration of the cloud as I observed it from 9 to 10 p. m.:



At the points marked *a* and *b*, but at no other place, rapid flashes of lightning, with now and then a bolt toward the earth, were playing; at *c'* *c''* *c'''* and *c''''*, the gray region between the cloud and the earth and which was evidently the region of falling rain, as shown by the flashes of lightning, the strange phenomenon occurred. This region, for brevity's sake, I will designate 'rain-region.'

At intervals of from one to two minutes (the lightning at *a* and *b* increasing from beginning to close of each interval) the entire rain-region would glow with a faint white light for about one or two seconds, rarely longer, in appearance similar to the auroral light. This light seemed to spring up at *c'* first, and, getting brighter while running to *c''''*, cease suddenly; immediately afterward the lightning at *a* and *b* would be least vigorous. The phenomenon continued to repeat itself during the hour that I observed the cloud; at first I supposed it to be a kind of sheet-lightning, but afterward, when watching it intently, I could see no signs of lightning proper, only a steadily increasing glow, which would remain along the entire rain-region for a second or two and then cease more suddenly than it came.

There were no streaks or flashes of lightning running through the cloud, which seemed to have a uniform density throughout its length from *a* to *b*, and this glow could not have been the reflected light from the flashes which occurred at either end of the cloud, as I carefully noted that the brightest flashes produced no such effect. Had the glow been reflected light, it would have been in flashes like the flash producing it.

At 2 a. m. on the 30th, I observed in the west and north an inky black cloud rapidly approaching from that direction in one long line accompanied by thunder and strong wind and followed by but little hail and little rain of large drops."

THUNDER-STORMS.

Thunder-storms occurred in the various districts on the following dates;

New England.—2d, 3d, 4th, 6th, 8th, 26th, 28th, 29th,

Middle Atlantic states.—3d, 5th, 8th, 11th, 13th, 16th, 20th, 24th to 29th.

South Atlantic states.—3d, 8th, 9th, 10th, 12th, 13th, 16th, 17th, 18th, 27th to 30th.

Florida peninsula.—1st to 10th, 12th, 17th, 18th, 19th, 24th, 30th.

Eastern Gulf states.—2d, 3d, 7th, 8th, 17th, 24th, 27th, 30th.

Western Gulf states.—2d, 3d, 5th, 6th, 7th, 9th, 11th, 14th to 25th, 28th, 29th, 30th.

Rio Grande valley.—12th, 16th, 17th, 18th, 24th, 25th.

Tennessee.—2d, 3d, 7th, 9th, 15th, 16th, 17th, 25th, 28th, 30th.

Ohio valley.—2d, 5th to 8th, 10th, 15th to 18th, 25th, 26th, 28th, 30th.

Lower lake region.—2d to 5th, 7th. 17th, 25th, 26th, 28th, 29th.

Upper lake region.—1st, 2d, 6th, 7th, 17th, 20th, 25th, 27th, 28th.

Extreme northwest.—6th, 11th, 15th, 17th, 18th, 21st, 22d, 24th.

Upper Mississippi valley.—1st, 2d, 5th, 7th, 10th, 12th, 15th, 16th, 17th, 20th, 21st, 22d, 25th, 26th, 28th, 30th.

Missouri valley.—1st, 2d, 3d, 5th to 8th, 10th, 11th, 12th, 14th to 30th.

Northern slope.—5th, 18th, 21st, 24th, 29th.

Middle slope.—1st to 6th, 8th, 13th, 14th, 15th, 18th to 21st, 24th, 27th, 28th, 29th.

Southern slope.—1st, 5th, 11th, 13th. 14th, 17th, 19th to 22d, 29th.

Southern plateau.—3d, 12th to 15th, 18th, 26th, 30th.

Middle plateau.—1st, 4th, 13th, 14th, 28th, 29th, 30th.

Northern plateau.—Boisé City, Idaho, 12th, 27th.

North Pacific coast region.—Roseburg, Oregon, 2d, 11th; Eola, Oregon, 12th.

Middle Pacific coast region.—2d, 4th, 7th to 12th, 15th, 19th, 26th, 30th.

South Pacific coast region.—San Diego, California, 13th; Los Angeles and Cahuenga valley, California, 27th.

OPTICAL PHENOMENA.

SOLAR HALOS.

Solar halos were observed in the various states and territories as follows:

Arizona.—25th.

Arkansas.—1st, 5th, 6th, 10th, 16th, 18th, 23d, 27th, 29th, 30th.

California.—1st, 3d, 5th, 6th, 9th, 11th, 12th, 18th, 23d, 24th, 25th.

Connecticut.—1st, 7th.

Dakota.—4th, 8th, 11th, 21st, 23d, 24th.

District of Columbia.—17th, 30th.

Florida.—4th, 12th, 13th, 15th, 17th, 20th, 21st, 22d, 25th, 30th.

Georgia.—4th, 6th, 22d, 29th, 30th.

Illinois.—1st, 6th, 8th, 9th, 11th, 20th, 27th, 29th.

Indiana.—1st, 9th, 21st, 23d.

Iowa.—8th, 11th, 12th, 24th, 25th, 27th, 28th, 29th.

Kansas.—8th, 16th, 20th, 26th, 27th.

Louisiana.—1st, 25th.

Maine.—19th, 26th.

Maryland.—17th, 18th.

Massachusetts.—7th, 9th, 11th, 15th, 28th.

Michigan.—1st, 4th, 5th, 9th, 10th, 14th, 16th, 17th, 18th, 25th, 26th, 27th.